

Application No. 10/534,569
Hunt *et al.*

In the Claims:

1-10. (cancelled)

11-33 (withdrawn)

44 (new). A gas flow chemical process for forming particles that contain elemental carbon and at least one other element or compound, said method comprising the steps of:

atomizing a fluid comprising an organic compound to form a stream of droplets predominantly less than 20 μm in size and

reacting said organic compound in said droplets to form particles containing carbon in elemental form,

wherein during the formation of said particles the droplets contain or are exposed to a second element or compound, or precursor thereof, so that said second element or compound is incorporated with the elemental carbon in the particles as they are formed.

45 (new). The process of claim 44 in which a stream of cooling medium is injected into the stream of particles to quench growth and aggregation of the carbonaceous material.

46 (new). The process of claim 44 or claim 45 wherein the organic compound droplets are predominantly less than 5 μm in diameter.

47 (new). The process of claim 46 wherein the organic compound droplets are predominantly less than 1 μm in diameter.

48 (new). The process of claim 44, wherein the reaction process is a combustion reaction.

49 (new). The process of claim 44, wherein the organic compound contains a cation precursor.

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50 (new). The process of claim 49 wherein the material formed is a composite of inorganic and carbonaceous materials.

51 (new). The process of claim 45 wherein said cooling medium is liquid in the form of sub 20 μm -sized droplets.

52 (new). The gas flow chemical process of claim 44 in which compounds are reacted, forming a particulate product comprising a first material that contains cations and a second material that is a carbonaceous material, the first and second materials being formed substantially contemporaneously to form a cation containing carbonaceous composite material.

53 (new). The process of claim 52 wherein the first material formed is an inorganic material.

54 (new). The process of claim 52 or claim 53 in which the second material formed is a polymer material.

55 (new). The process of claim 44 in which the droplets are atomized from a liquid source, which contains liquefied or dissolved gas.

56 (new). The process of claim 44 in which a liquid source of the said droplets is heated sufficiently and released through a nozzle to yield the desired formed size and distribution of carbonaceous material.

57 (new). The process of claim 44 in which the composite material formed is a powder.

58 (new). The process of claim 44 wherein the carbonaceous material formed is a powder with more than 20% of the formed material being primary particles not having any necking with other primary particles.

59 (new). The process of claim 44 in which the composite material is formed as a layer.

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60 (new). The process of claim 44 in which the material is formed at or above ambient pressure.

61 (new). The process of claim 44 in which the material is formed in a vacuum.

62 (new). The process of claim 44 in which at least one additional material is formed in the gas stream and becomes a part of the carbonaceous composite material.

63 (new). A composite formed by a gas flow chemical process according to claim 44, said composite comprising inorganic powder predominantly less than 100 nm in size, said inorganic material being coated at least in part with a carbonaceous material.

64 (new). The composite of claim 63 in which the composite is a powder with a hard agglomerated particle size of less than 1 μm .

65 (new). The composite of claim 63 or claim 64 in which the composite is a powder with a hard agglomerated particle size of less than 100 nm.

66 (new). The composite of claim 63 in the form of a layer.

67 (new). The composite of claim 63 in which the composite is a powder with additional material bonded to the surface of the carbonaceous material.

68 (new). The composite of claim 67 in which the material thus formed is electrochemically active.

69 (new). The composite of claim 63 in which the inorganic powder is a metal.

70 (new). The composite of claim 63 in which the formed material adds strength to a medium it is combined with.

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71 (new). The composite of claim 63 in which the formed material adds electrical conductivity to a medium when the medium and the composite are combined.